Assignment 2 Report

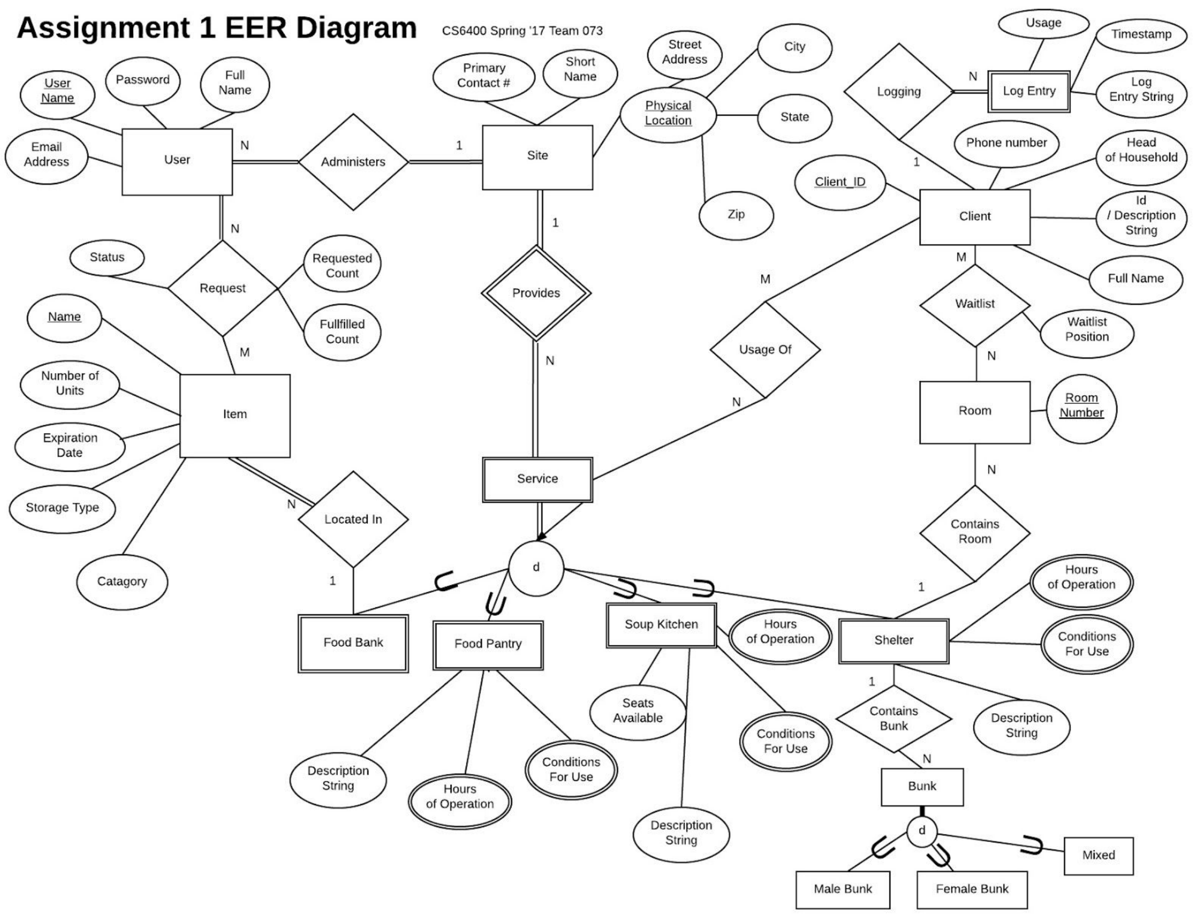
CS6400 Spring ‘17 Team 73

Modifications from project 1

Modifications based on Phase 1 feedback:

- Made log entry a weak entity
- Made item name a key
- Added ID to client, distinct from client ID
- Corrected notation for request relationship
- Corrected cardinality between site and service
- Made relationship between user and site mandatory
- Made relationship between log and client mandatory on the log side.
- Added phone number to client entity

Updated EER:



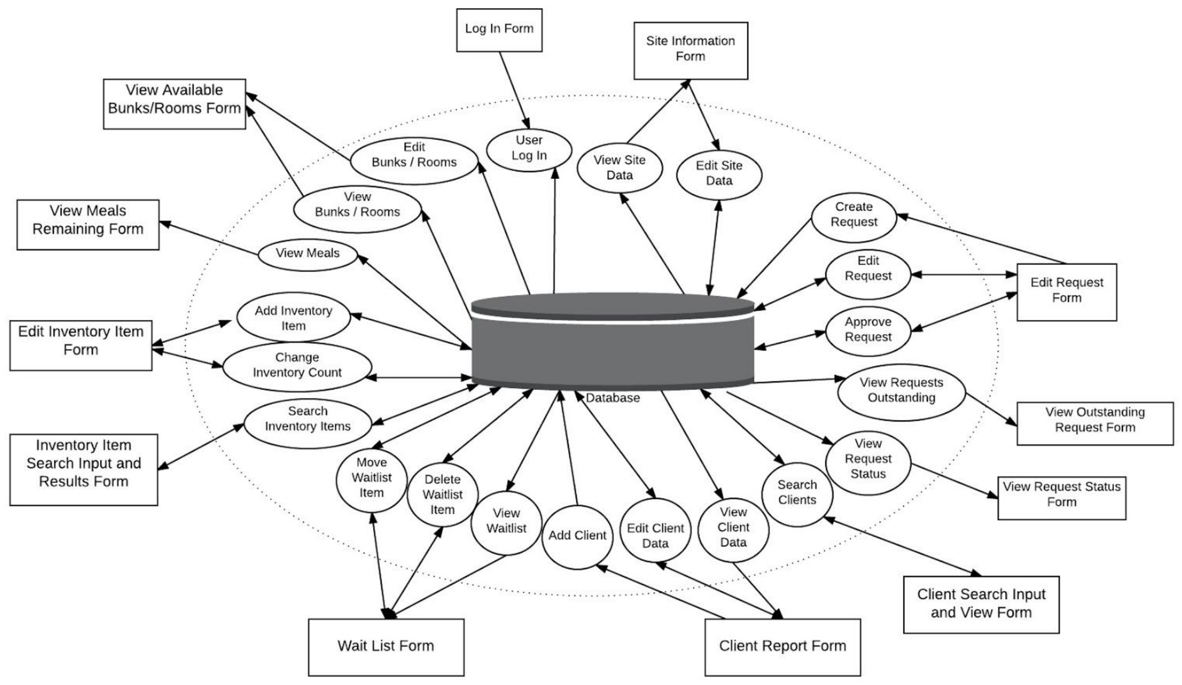
Modifications based on Phase 1 feedback:

- Added new tasks add/enroll client, modify bunk counts
- Separated forms for outstanding request report and status. View outstanding request task should corresponds to outstanding request report, view requests status task should corresponds to request status report. Don't group into a single form.

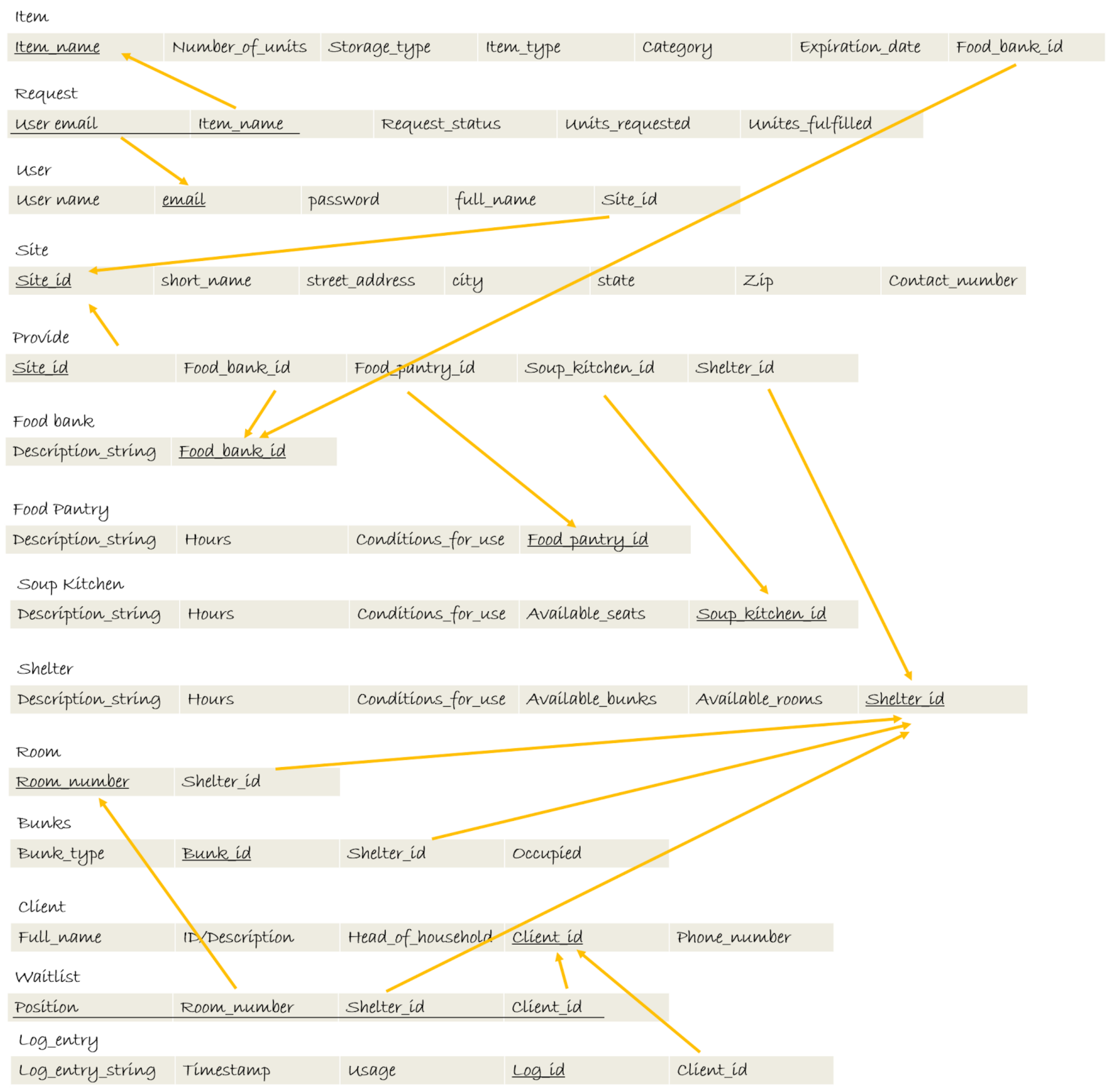
Updated IFD:

Assignment 1: Information Flow Diagram (IFD)

CS6400 Spring '17 Team 073



EER to relational mapping

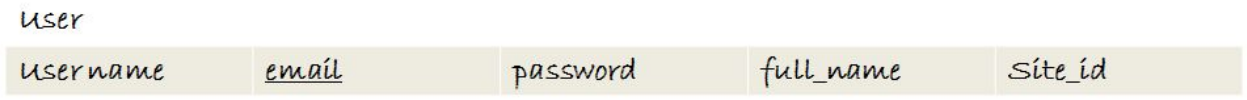

Item
Item_name | Number_of_units | Storage_type | Item_type | Category | Expiration_date | Food_bank_id
Request
User email | Item_name | Request_status | Units_requested | Unites_fulfilled
User
User name | email | password | full_name | Site_id
Site
Site_id | short_name | street_address | city | state | Zip | Contact_number
Provide
Site_id | Food_bank_id | Food_pantry_id | Soup_kitchen_id | Shelter_id
Food bank
Description_string | Food_bank_id
Food Pantry
Description_string | Hours | Conditions_for_use | Food_pantry_id
Soup Kitchen
Description_string | Hours | Conditions_for_use | Available_seats | Soup_kitchen_id
Shelter
Description_string | Hours | Conditions_for_use | Available_bunks | Available_rooms | Shelter_id
Room
Room_number | Shelter_id
Bunks
Bunk_type | Bunk_id | Shelter_id | Occupied
Client
Full_name | ID/Description | Head_of_household | Client_id | Phone_number
Waitlist
Position | Room_number | Shelter_id | Client_id
Log_entry
Log_entry_string | Timestamp | Usage | Log_id | Client_id

SQL Create Table Statements

(In format of lecture notes. For .sql file used to create mySQL database, see final section)

USER

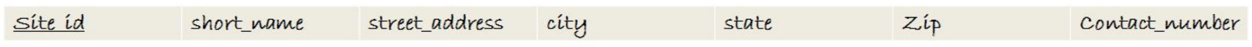
```
CREATE TABLE ‘User’(
        username       varchar(250)   NOT NULL,
        email          varchar(250)   NOT NULL,
	password	varchar(50)	NOT NULL,
	full_name	varchar(250)	NOT NULL,
	site_id		integer		NULL,
	PRIMARY_KEY(email),
	FOREIGN_KEY(site_id))
		REFERENCES Site (site_id) );
```


user

Username	email	password	full_name	Site_id

SITE

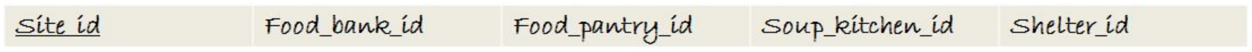
```
CREATE TABLE 'Site'(
	Site_id				integer		NOT NULL,
	short_name			varchar(250)	NOT NULL,
	street_address			varchar(250)	NOT NULL,
	city				varchar(250)	NOT NULL,
	state				varchar(50)	NOT NULL,
	zip				integer		NOT NULL,
	contact_number			varchar(50)	NULL,
	PRIMARY_KEY(Site_id));
```



Site id	short_name	street_address	city	state	Zip	Contact_number

PROVIDE

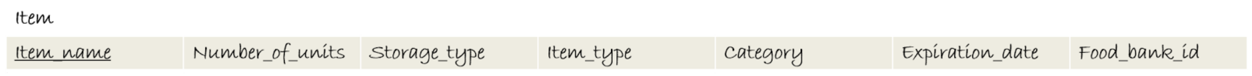
```
CREATE TABLE 'Provide'(
	site_id				integer		NOT NULL,
	food_bank_id			integer		NULL,
	food_pantry_id			integer		NULL,
	soup_kitchen_id			integer		NULL,
	shelter_id			integer		NULL,
          PRIMARY_KEY(site_id)),
          FOREIGN_KEY(site_id))
                    REFERENCES Site (site_id),
          FOREIGN_KEY(food_bank_id))
                    REFERENCES Food_Bank (food_bank_id),
          FOREIGN_KEY(food_pantry_id))
                    REFERENCES Food_Pantry (food_pantry_id),
          FOREIGN_KEY(soup_kitchen_id))
                    REFERENCES Soup_Kitchen (soup_kitchen_id),
          FOREIGN_KEY(shelter_id))
                    REFERENCES Shelter (shelter_id));
```



Site_id	Food_bank_id	Food_pantry_id	Soup_kitchen_id	Shelter_id

ITEM

```
CREATE TABLE 'Item'(
          item_name                          varchar(250)   NOT NULL,
          number_of_units                    integer        NULL,
          storage_type                       enum           NULL,
          item_type                          enum           NULL,
          food_category                      enum           NULL,
          supply_catagory                    enum           NULL,
          expiration_date                    DATETIME       NULL,
          food_bank_id                       integer        NULL,
          PRIMARY_KEY(item_name)),
          FOREIGN_KEY(food_bank_id))
                    REFERENCES Food_Bank (food_bank_id));
```

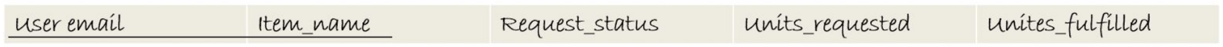


Item

Item_name	Number_of_units	Storage_type	Item_type	Category	Expiration_date	Food_bank_id

REQUEST

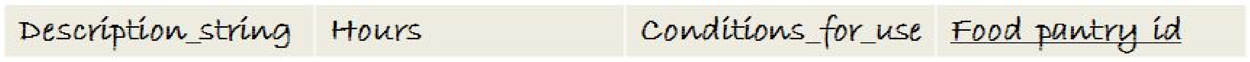
```
CREATE TABLE 'Request'(
          email                                        varchar(250)   NOT NULL,
          item_name                                    varchar(250)   NOT NULL,
          request_status                               integer        NULL,
          units_requested                              integer        NULL,
          units_fulfilled                              integer        NULL,
          PRIMARY_KEY(email, item_name, request_id)),
          FOREIGN_KEY(email))
                    REFERENCES User (email)),
        FOREIGN_KEY(item_name))
                REFERENCES Item (item_name));
```



User email	Item_name	Request_status	Units_requested	Unites_fulfilled

FOOD PANTRY

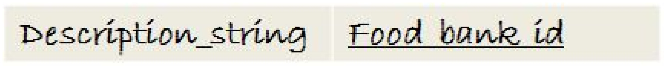
```
CREATE TABLE 'Food Pantry'(
        food_pantry_id              integer         NOT NULL,
        Description_string          varchar(250)    NOT NULL,
        Hours                       varchar(50)     NOT NULL,
        Conditions_for_use          varchar(250)    NOT NULL,
        PRIMARY_KEY(food_pantry_id)) );
```



Description_string	Hours	Conditions_for_use	Food pantry id

FOOD BANK

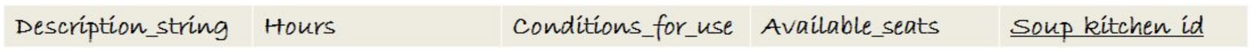
```
CREATE TABLE 'Food Bank'(
        Food_bank_id                integer         NOT NULL,
        Description_string          varchar(50)     NOT NULL,
        PRIMARY_KEY(Food_bank_id)) );
```



Description_string	Food bank id

SOUP KITCHEN

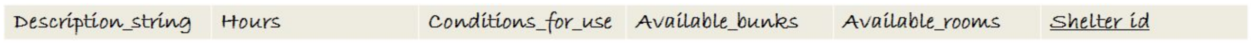
```
CREATE TABLE 'Soup Kitchen'(
        soup_kitchen_id             integer         NOT NULL,
        Description_string          varchar(250)    NOT NULL,
        Hours                       varchar(50)     NOT NULL,
        Conditions_for_use          varchar(50)     NOT NULL,
        available_seats             integer         NOT NULL,
        PRIMARY_KEY(soup_kitchen_id)) );
```



Description_string	Hours	Conditions_for_use	Available_seats	Soup kitchen id

SHELTER

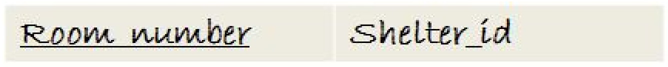
```
CREATE TABLE 'Shelter'(
        Shelter_id                  integer         NOT NULL,
        Description_string          varchar(250)    NOT NULL,
        Hours                       varchar(250)    NOT NULL,
        Conditions_for_use          varchar(250)    NOT NULL,
        available_bunks             integer         NOT NULL,
        available_rooms             integer         NOT NULL,
        PRIMARY_KEY(Shelter_id)) );
```



Description_string	Hours	Conditions_for_use	Available_bunks	Available_rooms	Shelter id

ROOM

```
CREATE TABLE ‘Room’(
        room_number                 integer         NOT NULL,
        Shelter_id                  integer         NOT NULL,
        PRIMARY_KEY(room_number,Shelter_id)),
        FOREIGN_KEY(Shelter_id))
                REFERENCES Shelter (Shelter_id));
```



Room number	Shelter_id

BUNK

```
CREATE TABLE ‘Bunk’(
        bunk_type                   enum            NOT NULL,
        bunk_id                     integer         NOT NULL,
        Shelter_id                  integer         NOT NULL,
        PRIMARY_KEY(bunk_id)),
        FOREIGN_KEY(Shelter_id))
                REFERENCES Shelter (Shelter_id));
```

Bunk_type	Bunk_id	Shelter_id	Occupied

CLIENT

```
CREATE TABLE ‘Client’(
        client_id                       integer         NOT NULL,
        full_name                       varchar(250)    NOT NULL,
        description_string              varchar(250)    NOT NULL,
        head_of_household               boolean         NOT NULL,
        PRIMARY_KEY(client_id)));
```

Client

Full_name	ID/Description	Head_of_household	Client_id	Phone_number

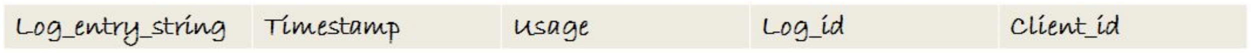
WAITLIST

```
CREATE TABLE ‘Waitlist’(
        position                        integer         NOT NULL,
        room_number                     integer         NOT NULL,
        client_id                       integer         NOT NULL,
        PRIMARY_KEY(position, room_number, client_id))
        FOREIGN_KEY(room_number))
                REFERENCES Room (room_number));
        FOREIGN_KEY(client_id))
                REFERENCES Client (client_id));
```

Waitlist

Position	Room_number	Shelter_id	Client_id

LOG ENTRY

```
CREATE TABLE ‘Log_entry’(
        log_id                          integer         NOT NULL,
        log_entry_string                varchar(250)    NOT NULL,
        timestamp                       DATETIME        NOT NULL,
        usage                           integer         NOT NULL,
        client_id                       integer         NOT NULL,
        PRIMARY_KEY(log_id)),
        FOREIGN_KEY(client_id))
                REFERENCES Client (client_id));
```


Log_entry_string	Timestamp	usage	Log_id	Client_id

Tasks with SQL

Login

Task Decomposition:
Lock Types: Read-only on User table
Enabling Conditions: None

Frequency: Frequent
Schemas: Single
Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT count(username) FROM User WHERE username=$username and password=$password;

- User enters *username* ($Username), *password* ($Password) input fields.
- If data validation is successful for both *username* and *password* input fields, then when **Enter** button is clicked:
- If User record is found but User.password != ‘$Password or User record is not found’:
    - Go back to ***Login*** form, with error message.

View Site Data

Task Decomposition:

Lock Types: Read only on site table, services tables
Enabling Conditions: None, publicly available
Frequency: Frequent
Schemas: Site table, services table
Consistency: Not important

Subtasks: Requires mother task, but all tasks can be done in parallel. Display site in top frame, display each service in separate frame

Abstract Code:

```
SELECT Site.short_name, Site.street_address, Site.city, Site.state, Site.full_name,
Site.zip, Site.contact_number,Food_Pantry.description_string, Food_Pantry.hours,
Food_Pantry.conditions_for_use, Food_Bank.description_string,
Soup_Kitchen.description_string, Soup_Kitchen.hours,
Soup_Kitchen.conditions_for_use, Soup_Kitchen.available_seats,
Shelter.description_string, Shelter.hours, Shelter.conditions_for_use,
Shelter.available_bunks, Shelter.available_rooms FROM Site LEFT JOIN Provide on
Provide.site_id=Site.site_id LEFT JOIN Food_Pantry on
Food_Pantry.food_pantry_id=Provide.food_pantry_id LEFT JOIN Food_Bank on
Food_Bank.food_bank_id=Provide.food_bank_id LEFT JOIN Soup_Kitchen on
Soup_Kitchen.soup_kitchen_id=Provide.soup_kitchen_id LEFT JOIN Shelter on
Shelter.shelter_id=Provide.shelter_id WHERE Site.site_id=$site_id;
```

- User enters site_id
- Display all attributes of the site, or any service the site proves

Edit Site Data

Task Decomposition:
Lock Types: Read/write on site/service table
Enabling Conditions: Logged in as user who administers site
Frequency: Infrequent, but more common to modify service than modify site
Schemas: Site table, services tables, attributes of any sub-class
Consistency: Important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
UPDATE Site set
short_name=$short_name,street_address=$street_addr,city=$city,state=$state,full_name=$name,zip=$zip,contact_number=$contact WHERE site_id=$site_id;

- Display ***View Site Data***
- Display dropdown for service type
- Display text field for all *attributes* of any service
- Display ***X*** button next to each service
- When ***Add Service*** Button is pressed:
  - Validate input
  - Create new service with displayed attributes
- When ***Submit*** Button is pressed:
  - Write attributes of site

Create Request

Task Decomposition:
Lock Types Write lock on request table, read on request_items
Enabling Conditions: Logged in as user

Frequency: Frequent
Schemas: Request table, keys from user and item tables
Consistency: Important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:

INSERT INTO Request(username,item_name,
request_status,units_requested,units_fulfilled) VALUES
($username,$requested_item,"pending",$requested_count,0);

- Display ***View Items*** form
- Display the $*item count* text field next to each item
- When ***Submit*** button is pressed:
  - Validate input (e.g. If $request is for food bank at $users site)
  - Create request of selected item, from $user, with given count

Edit Request

Task Decomposition:

Lock Types: Read/Write lock on request table

Enabling Conditions: Logged in as user

Frequency: Frequent

Schemas: Request table

Consistency: Important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:

UPDATE Request SET Request.units_requested=$units_requested WHERE
Request.username=$requestingUser AND Request.item_name=$item_name;

- Display ***View Requests*** form
- When the ***Submit*** button is pressed:
  - Validate input
  - If $user is not original requester
    - Error
  - Else:
    - Set count of displayed request to updated value.

Approve Request

Task Decomposition:
Lock Types: Read/write lock on request table, read/write lock on inventory table
Enabling Conditions: Logged in as user for food bank
Frequency: Frequent
Schemas: Requests, items
Consistency: Important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
UPDATE Request INNER JOIN Item on Request.item_name=Item.item_name INNER JOIN User on Item.food_bank_id=User.site_id SET Request.units_fulfilled=$fulfilled_count, Request.request_status="approved", Item.number_of_units=Item.number_of_units-$fulfilled_count WHERE User.username=$username AND Request.username=$requestingUser AND Request.item_name=$itemName AND Item.number_of_units>$fulfilled_count;

- Display ***View Requests*** outstanding Form
- Display *approved amount* attribute next to each request associated with $user's food bank (if any)
- When ***Approve*** button is pressed:
    - If item count at food bank is less than or equal to approved amount
    - Reduce item count at food bank by approved amount
    - Set request status to resolved
    - Else:
        - Error

View Requests Outstanding

Task Decomposition:
Lock Types: Read on user table, read on sites table, read on requests table, read on inventory table
Enabling Conditions: Logged in as user for food bank
Frequency: Frequent
Schemas: Requests, sites, users, inventory
Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT Request.username, Request.item_name, Request.request_status, Request.units_requested, Request.units_fulfilled FROM Request INNER JOIN Item on Request.item_name=Item.item_name INNER JOIN User on Item.food_bank_id=User.site_id WHERE User.username=$username;

- Find $site administered by $user
- For each $request associated with $site
    - Display $request.user, $request.requested count
    - Display $count of corresponding $item at food bank (0 if there is no matching item)
    - Calculate the total number of that item that have been requested
    - If the total requests for that item exceed the supply, highlight the line in red

Note: Site must have a food bank according to enabling conditions to display requests associated with a given food bank.

View Request Status

Task Decomposition:
Lock Types: Read on user table, read on requests table
Enabling Conditions: Logged in as user

Frequency: Frequent
Schemas: Requests, users
Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT username, item_name, request_status,units_requested,units_fulfilled FROM Request WHERE username= $username ORDER BY request_status;

- Open all requests associated with $user
- For each $request ordered by status
    - Display $request.date, $request.site, $request.requested_count, $request.approved count, $request.status

Search Clients

Task Decomposition:
Lock Types: Read on clients

Enabling Conditions: Logged in as user

Frequency: Frequent
Schemas: Single
Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT full_name, client_id, description_string, head_of_household FROM Client WHERE full_name like "%$search_field%";

- Display text box $*input*
- On ***Search*** button press:
    - Validate the search text box
    - $client_list= Find all clients with name like %$input%
    - If count($client_list)>5, error("Please enter more unique search criteria")
    - Else
        - For each $client
            - Display $client.id, $client.name, $client.head of household status

View Client Data

Task Decomposition:
Lock Types: Read on clients
Enabling Conditions: Logged in as user

Frequency: Frequent
Schemas: Single
Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT full_name, description_string, head_of_household FROM Client WHERE client_id=$client_id;

- Display text box $*input*
- On ***View Client*** button press:
    - Validate input
        - Find client with identifier $input
        - Display $client.name, $client.id, and $client.head_of_household

View Waitlist

Task Decomposition:

Lock Types: Read on waitlist, read on user, read on site, read on client
Enabling Conditions: Logged in as user with shelter
Frequency: Frequent
Schemas: Single
Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT client_id, position from Waitlist WHERE shelter_id=$shelter_number AND room_number=$room_number ORDER BY position ASC;

- Determine shelter associated with site associated with $user
- For each $client on waitlist, sorted by waitlist position
  - Display $client

Delete Waitlist Item

Task Decomposition:
Lock Types: Read/write on waitlist
Enabling Conditions: Logged in as user associated with shelter
Frequency: Infrequent
Schemas: Multiple
Consistency: Important

Subtasks: Mother Task is not needed. No decomposition needed.
DELETE FROM Waitlist WHERE position=$position and shelter_id=$shelter_id AND room_number=$room_number;
UPDATE Waitlist SET position=position-1 WHERE position>$position AND shelter_id=$shelter_id AND room_number=$room_number;

Abstract Code:

- Display ***Waitlist*** form
- Display ***X*** button next to each waitlist item
- On '***X***' button press:
  - Set $previous_position to $selected_item.position
  - Remove $selected_item
  - For each $waitlist_item with position above $selected_item.position, decrement $selected_item.position

Move Waitlist Item

Task Decomposition:

Lock Types: Read/write on waitlist
Enabling Conditions: Logged in as user associated with shelter
Frequency: Infrequent
Schemas: Multiple
Consistency: Important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
UPDATE Waitlist SET position=position-1 WHERE position>$old_position AND shelter_id=$shelter_id AND room_number=$room_number ;
UPDATE Waitlist SET position=position+1 WHERE position>$new_position AND shelter_id=$shelter_id AND room_number=$room_number;

- Display ***Waitlist*** Form
- Display text box1 ($*selected_item*)
- Display text box1 ($*New_position*)
- On ***'(Up Arrow)'*** or '(***Down Arrow***)' button press (up arrow and down arrow are represented as arrow icons):
    - Validate input (e.g. new position >0 and <len(waitlist))
    - Set $previous_position to $selected_item.position
    - Set $selected_item.position to $new_position
    - For each $waitlist_item with position above $previous_position
        - Decrement $selected_item.position
    - For each $waitlist_item with position below $selected_item.position:
        - Increment $selected_item.position

Search Inventory Items

Task Decomposition:
Lock Types: Read on inventory, read on site, read on user
Enabling Conditions: Logged in as user

Frequency: Frequent
Schemas: Multiple
Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT item_name, number_of_units, storage_type, item_type, food_category, supply_category,expiration_date, food_bank_id FROM Item where ($expiration_Date="*" or expiration_date=$expiration_date) AND ($stoarge_type="*" OR

storage_type=$storage_type) AND ($food_type="*" OR item_type=$food_type) AND ($food_category="*" OR food_category=$food_category") AND($supply_category="*" OR supply_category=$supply_category) AND item_name LIKE "%$item_name%";

- Display a text box for $*expiration date* (default ‘’)
- Display a dropdown for $*storage_type* (containing all known storage types)
- Display a dropdown for $*type* (containing ‘food’ and ‘supply’)
- Display a dropdown for $*category* (containing initially all categories of food and supply)
- Display a text box for $*keyword* (default ‘’)
- On dropdown select:
    - Select all inventory matching new restrictions.

Change Inventory Count

Task Decomposition:
Lock Types: Read/write on inventory, read on users, read on site
Enabling Conditions: Logged in as user associated with food bank
Frequency: Moderate
Schemas: Multiple
Consistency: Important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:

UPDATE Item SET number_of_units=$NUM_UNITS WHERE item_name=$ITEM_NAME;

```
● Display Search Inventory item form.
● Display text field $count next to each found item
● On Search button press:
    ○ For $item with non-empty $field value
        ■ If $item not in $users food bank
            ● Display error, continue
        ■ Else:
            ● $item.count=$count
```

Add Inventory Item

Task Decomposition:
Lock Types: Write on inventory, read on user, read on site
Enabling Conditions: Logged in as user associated with food bank
Frequency: Moderate

Schemas: Multiple
Consistency: Important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT distinct(item_type) FROM Item;
SELECT distinct(food_category) FROM Item;
INSERT INTO Item(item_name, number_of_units, storage_type, item_type, food_category,supply_category, expiration_date, food_bank_id) VALUES ($ITEM_NAME, $NUM_UNITS, $STORAGE_TYPE, $ITEM_TYPE, $FOOD_CATEGORY, $SUPPLY_CATEGORY, $EXPIRATION_DATE, $FOOD_BANK_ID);

- Display dropdown for $*item_type* (Containing all available item types)
- Display dropdown for $*item_category* .
- Display text box for $*expiration_date* (default 01/01/9999)
- Display text box for $*description*.
- On button press:
    - Validate input
    - Create new item with the site associated with the user, attributes according to input fields
    - Reset fields

View Meals

Task Decomposition:
Lock Types: Read on items
Enabling Conditions: None

Frequency: Moderate
Schemas: Single
Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT min(counts.count) as low, max(counts.count) AS total_meals FROM (
SELECT 'vegetable' AS type, count(item_name) AS count FROM Item WHERE food_category = 'vegetables'
UNION
SELECT 'mineral' AS type, count(item_name) AS count FROM Item WHERE food_category = 'beans' OR food_category = 'nuts' OR food_category = 'grains'

UNION
SELECT 'animal' AS type, count(item_name) AS count FROM Item WHERE food_category = 'meat' OR food_category = 'seafood' OR food_category = 'dairy') AS counts;
SELECT counts.type as send_more FROM (
SELECT 'vegetable' AS type, count(item_name) AS count FROM Item WHERE food_category = 'vegetables'
UNION
SELECT 'mineral' AS type, count(item_name) AS count FROM Item WHERE food_category = 'beans' OR food_category = 'nuts' OR food_category = 'grains'
UNION
SELECT 'animal' AS type, count(item_name) AS count FROM Item WHERE food_category = 'meat' OR food_category = 'seafood' OR food_category = 'dairy') AS counts WHERE counts.count=$low;

- $v= sum(count) of $items where $item.category= vegetables
- $n= sum(count) of $items where $item.category= nuts or $item.category = grains or $item.category = beans
- $p= sum(count) of $items where $item.category= meat or $item.category = seafood or $item.category = dairy or $item.category = eggs
- Display “Total meals =”+min($v,$n,$p)
- Display “Need more “+argmin($v, $n, $p)

View Bunks/Rooms

Task Decomposition:
Lock Types: Read on site, rooms
Enabling Conditions: None

Frequency: Frequent
Schemas: Mixed

Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:

SELECT count(Bunk.bunk_number), bunk_type, Shelter.description_string, Shelter.hours, Shelter.conditions_for_use FROM Bunk INNER JOIN Shelter on Shelter.shelter_id=Bunk.shelter_id GROUP BY Bunk.bunk_type, Shelter.shelter_id

```
//If empty, "Sorry, all shelters are currently at maximum capacity"
    ● $found = false
    ● For each $shelter:
        ○ $male=$shelter.male_bunks
        ○ $female=$shelter.female_bunks
        ○ $mixed=$shelter.mixed_bunks
        ○ If $mixed = 0 and $male = 0 and $female = 0:
            ■ Continue
        ○ $found= true
        ○ Display $shelter.name
        ○ Display $shelter.location
        ○ Display $shelter.phone_number
        ○ Display $shelter.hour_of_operations
        ○ Display $shelter.conditions
        ○ Display $bunks
●   If not $found:
            ○ Display "Sorry, all shelters are currently at maximum capacity"
```

Add Client

Task Decomposition:
Lock Types: Write on client
Enabling Conditions: None

Frequency: Moderate
Schemas: Single

Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:

```
Insert into Client(full_name, description_string, head_of_household)
VALUES($FullName,$Description,$HeadOfHousehold);
    ● Display fields for $FullName, $ID/Description, $HeadOfHouseHold,
      $PhoneNumber
    ● On Button Press:
        ○ Insert into clients client with $Unique ID,$FullName, $ID/Description,
          $HeadOfHouseHold, $PhoneNumber
```

Check In Client to Service

Task Decomposition:
Lock Types: Read/Write on Shelter, Read on User,
Enabling Conditions: Logged in as user for a service

Frequency: Moderate
Schemas: Single

Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
SELECT Shelter.shelter_id, Bunk.bunk_number from Shelter INNER JOIN User on User.site_id=Shelter.shelter_id INNER JOIN Bunk on Bunk.shelter_id=Shelter.shelter_id WHERE Shelter.available_bunks>0 AND User.username = $username AND Bunk.bunk_type=$gender OR Bunk.bunk_type="mixed" ORDER BY Bunk.bunk_type LIMIT 1;

UPDATE Shelter INNER JOIN Bunk on Bunk.shelter_id=Shelter.shelter_id SET Shelter.available_rooms=Shelter.available_bunks-1,Bunk.occupied=True WHERE Shelter.shelter_id=$shelter_id AND Bunk.bunk_number=bunk_number;

- Request $gender
- Identify service associated with $user
- If service has available bunks:
    - Find bunk associated with service which is not occupied and with gender $gender
    - If none, find bunk associated with service which is not occupied and with gender $mixed
    - If not none:
        - Set bunk to occupied
        - Decrease bunk_count by 1

Modify Bunk Count

Task Decomposition:
Lock Types: Read/Write on Shelter, Read on User
Enabling Conditions: Logged in as user for a service

Frequency: Infrequent
Schemas: Single

Consistency: Not important

Subtasks: Mother Task is not needed. No decomposition needed.

Abstract Code:
Update Shelter INNER JOIN User ON User.site_id=Shelter.shelter_id SET Shelter.available_bunks=$available_bunks WHERE User.username=$username

- Request $updated_bunk_count
- Identify shelter associated with $user
- If $updated_bunk_count>0:
    - Update shelter.bunk_count to $updated_bunk_count

SQL code to create schema

```
DROP DATABASE IF EXISTS `cs6400_sp17_team073`;


SET default_storage_engine=InnoDB;


CREATE DATABASE IF NOT EXISTS cs6400_sp17_team073 DEFAULT CHARACTER SET
utf8 COLLATE utf8_general_ci;
USE cs6400_sp17_team073;

-- Tables

CREATE TABLE User (
  username varchar(250) NOT NULL,
  email varchar(250) NOT NULL,
  password varchar(50) NOT NULL,
  full_name varchar(250) NOT NULL,
  site_id int(16)unsigned,
  PRIMARY KEY (username)
);

CREATE TABLE Site (
  site_id int(16) unsigned NOT NULL AUTO_INCREMENT,
  short_name varchar(250) NOT NULL,
  street_address varchar(250) NOT NULL,
  city varchar(250) NOT NULL,
  state varchar(50) NOT NULL,
  full_name varchar(250) NOT NULL,
  zip int(16) unsigned NOT NULL,
  contact_number varchar(50) NOT NULL,
  PRIMARY KEY (site_id)
);


CREATE TABLE Provide (
  site_id int(16) unsigned NOT NULL AUTO_INCREMENT,
  food_bank_id int(16) unsigned,
  food_pantry_id int(16) unsigned,
  soup_kitchen_id int(16) unsigned,
  shelter_id int(16) unsigned,
  PRIMARY KEY (site_id)
);

CREATE TABLE Item (
  item_name varchar(250) NOT NULL,
  number_of_units int(16) unsigned,
  storage_type int(16) unsigned NOT NULL,
  item_type int(16) unsigned NOT NULL,
  food_category int(16) unsigned NOT NULL,
  supply_category int(16) unsigned NOT NULL,
  expiration_date DATETIME NOT NULL,
  food_bank_id int(16) unsigned,
  PRIMARY KEY (item_name)
);

CREATE TABLE Request (
  username varchar(250) NOT NULL,
  item_name varchar(250) NOT NULL,
  request_status int(16) unsigned NOT NULL,
  units_requested int(16) unsigned NOT NULL,
  units_fulfilled int(16) unsigned,
  PRIMARY KEY (username,item_name)
);

CREATE TABLE Food_Pantry (
  food_pantry_id int(16) unsigned NOT NULL AUTO_INCREMENT,
  description_string varchar(250) NOT NULL,
  hours varchar(50) NOT NULL,
  conditions_for_use varchar(250) NOT NULL,
  PRIMARY KEY (food_pantry_id)
);


CREATE TABLE Food_Bank (
  food_bank_id int(16) unsigned NOT NULL AUTO_INCREMENT,
  description_string varchar(250) NOT NULL,
  PRIMARY KEY (food_bank_id)
);

CREATE TABLE Soup_Kitchen (
  soup_kitchen_id int(16) unsigned NOT NULL AUTO_INCREMENT,
  description_string varchar(250) NOT NULL,
  hours varchar(50) NOT NULL,
  conditions_for_use varchar(250) NOT NULL,
  available_seats int(16),
  PRIMARY KEY (soup_kitchen_id)
);

CREATE TABLE Shelter (
  shelter_id int(16) unsigned NOT NULL AUTO_INCREMENT,
  description_string varchar(250) NOT NULL,
  hours varchar(50) NOT NULL,
  conditions_for_use varchar(250) NOT NULL,
  available_bunks int(16),
  available_rooms int(16),
  PRIMARY KEY (shelter_id)
);

CREATE TABLE Room (
  room_number int(16) unsigned NOT NULL AUTO_INCREMENT,
  shelter_id int(16) unsigned NOT NULL,
  PRIMARY KEY (room_number,shelter_id)
);

CREATE TABLE Bunk (
  bunk_number int(16) unsigned NOT NULL AUTO_INCREMENT ,
  bunk_type int(16) unsigned NOT NULL,
  shelter_id int(16) unsigned NOT NULL,
  occupied boolean,
  PRIMARY KEY (bunk_number)
);

CREATE TABLE Client (
  client_id int(16) unsigned NOT NULL AUTO_INCREMENT,
  full_name varchar(250) NOT NULL,
  description_string varchar(250) NOT NULL,
  head_of_household boolean,
  PRIMARY KEY (client_id)
);

CREATE TABLE Waitlist (
  position int(16) unsigned NOT NULL,
  room_number int(16) unsigned NOT NULL,
  shelter_id int(16) unsigned NOT NULL,
  client_id int(16) unsigned NOT NULL,
  PRIMARY KEY (position,room_number,client_id,shelter_id)
);

CREATE TABLE Log_Entry (
  log_id int(16) unsigned NOT NULL AUTO_INCREMENT,
  log_entry_string varchar(250) NOT NULL,
  timestamp datetime NOT NULL,
  log_usage int(16) unsigned NOT NULL,
  client_id int(16) unsigned NOT NULL,
  PRIMARY KEY (log_id)
);


--  Table Constraints

ALTER TABLE `User`
  ADD CONSTRAINT User_ibfk_1 FOREIGN KEY (site_id) REFERENCES `Site` (site_id);

ALTER TABLE `Provide`
  ADD CONSTRAINT Provide_ibfk_1 FOREIGN KEY (site_id) REFERENCES `Site` (site_id),
  ADD CONSTRAINT Provide_ibfk_2 FOREIGN KEY (food_bank_id) REFERENCES
`Food_Bank` (food_bank_id),
  ADD CONSTRAINT Provide_ibfk_3 FOREIGN KEY (food_pantry_id) REFERENCES
`Food_Pantry` (food_pantry_id),
  ADD CONSTRAINT Provide_ibfk_4 FOREIGN KEY (soup_kitchen_id) REFERENCES
`Soup_Kitchen` (soup_kitchen_id),
  ADD CONSTRAINT Provide_ibfk_5 FOREIGN KEY (shelter_id) REFERENCES `Shelter`
(shelter_id);

ALTER TABLE `Item`
  ADD CONSTRAINT Item_ibfk_1 FOREIGN KEY (food_bank_id) REFERENCES `Food_Bank`
(food_bank_id);

ALTER TABLE `Request`
  ADD CONSTRAINT Request_ibfk_1 FOREIGN KEY (username) REFERENCES `User`
(username),
  ADD CONSTRAINT Request_ibfk_2 FOREIGN KEY (item_name) REFERENCES `Item`
(item_name);

ALTER TABLE `Room`
  ADD CONSTRAINT Room_ibfk_1 FOREIGN KEY (shelter_id) REFERENCES `Shelter`
(shelter_id);

ALTER TABLE `Bunk`
  ADD CONSTRAINT Bunk_ibfk_1 FOREIGN KEY (shelter_id) REFERENCES `Shelter`
(shelter_id);

ALTER TABLE `Waitlist`
  ADD CONSTRAINT Waitlist_ibfk_1 FOREIGN KEY (room_number) REFERENCES `Room`
(room_number),
  ADD CONSTRAINT Waitlist_ibfk_2 FOREIGN KEY (client_id) REFERENCES `Client`
(client_id),
  ADD CONSTRAINT Waitlist_ibfk_3 FOREIGN KEY (shelter_id) REFERENCES `Shelter`
(shelter_id);

ALTER TABLE `Log_Entry`
  ADD CONSTRAINT Log_Entry_ibfk_1 FOREIGN KEY (client_id) REFERENCES `Client`
(client_id);
```

Appendix 1: SQL test code

```
USE cs6400_sp17_team073;
/*INSERT INTO Site values(1,"s","s","c","tx","site",78759,"numbers");
INSERT INTO User values("Taylor", "TaylorPhebus@gmail.com","password","Taylor", 1);
INSERT INTO Request(username,item_name, request_status,units_requested,units_fulfilled)
VALUES ("Taylor","Peanut Butter","pending",10,0);
INSERT INTO Food_Bank(description_string) VALUES("Food Bank");*/
```

```
/*Log in
SELECT count(username) FROM User WHERE username=$username and
password=$password;
*/
SELECT count(username) FROM User WHERE username="taylor" and password="password";

/*View Site Data
SELECT Site.short_name, Site.street_address, Site.city, Site.state, Site.full_name, Site.zip,
Site.contact_number,Food_Pantry.description_string, Food_Pantry.hours,
Food_Pantry.conditions_for_use, Food_Bank.description_string,
Soup_Kitchen.description_string, Soup_Kitchen.hours, Soup_Kitchen.conditions_for_use,
Soup_Kitchen.available_seats, Shelter.description_string, Shelter.hours,
Shelter.conditions_for_use, Shelter.available_bunks, Shelter.available_rooms FROM Site LEFT
JOIN Provide on Provide.site_id=Site.site_id LEFT JOIN Food_Pantry on
Food_Pantry.food_pantry_id=Provide.food_pantry_id LEFT JOIN Food_Bank on
Food_Bank.food_bank_id=Provide.food_bank_id LEFT JOIN Soup_Kitchen on
Soup_Kitchen.soup_kitchen_id=Provide.soup_kitchen_id LEFT JOIN Shelter on
Shelter.shelter_id=Provide.shelter_id WHERE Site.site_id=$shelter_id;
*/
SELECT Site.short_name, Site.street_address, Site.city, Site.state, Site.full_name, Site.zip,
Site.contact_number,Food_Pantry.description_string, Food_Pantry.hours,
Food_Pantry.conditions_for_use, Food_Bank.description_string,
Soup_Kitchen.description_string, Soup_Kitchen.hours, Soup_Kitchen.conditions_for_use,
Soup_Kitchen.available_seats, Shelter.description_string, Shelter.hours,
Shelter.conditions_for_use, Shelter.available_bunks, Shelter.available_rooms FROM Site LEFT
JOIN Provide on Provide.site_id=Site.site_id LEFT JOIN Food_Pantry on
Food_Pantry.food_pantry_id=Provide.food_pantry_id LEFT JOIN Food_Bank on
Food_Bank.food_bank_id=Provide.food_bank_id LEFT JOIN Soup_Kitchen on
Soup_Kitchen.soup_kitchen_id=Provide.soup_kitchen_id LEFT JOIN Shelter on
Shelter.shelter_id=Provide.shelter_id WHERE Site.site_id=1;

/*Edit Site Data
UPDATE Site set
short_name=$short_name,street_address=$street_addr,city=$city,state=$state,full_name=$na
me,zip=$zip,contact_number=$contact WHERE site_id=$site_id;
*/
UPDATE Site set
short_name="tmp",street_address="addr",city="city",state="st",full_name="name",zip=12345,co
ntact_number="12345" WHERE site_id=1;
/*Make sure User table is populated, one time*/
/*Create Request
```

```
INSERT INTO Request(username,item_name, request_status,units_requested,units_fulfilled)
VALUES ($username,$requested_item,"pending",$requested_count,0);
*/

/*Edit Request
UPDATE Request SET Request.units_requested=5 WHERE
Request.username=$requestingUser AND Request.item_name=$item_name;
*/
UPDATE Request SET Request.units_requested=5 WHERE Request.username="Taylor" AND
Request.item_name="Peanut Butter";

/*Approve Request
UPDATE Request INNER JOIN Item on Request.item_name=Item.item_name INNER JOIN
User on Item.food_bank_id=User.site_id SET Request.units_fulfilled=3,
Request.request_status="approved" WHERE User.username=$username AND
Request.username=$requestingUser AND Request.item_name=$itemName;
*/
UPDATE Request INNER JOIN Item on Request.item_name=Item.item_name INNER JOIN
User on Item.food_bank_id=User.site_id SET Request.units_fulfilled=3,
Request.request_status="approved" WHERE User.username="Taylor" AND
Request.username="Taylor" AND Request.item_name="Peanut Butter";

/*View Requests Outstanding
SELECT Request.username, Request.item_name, Request.request_status,
Request.units_requested, Request.units_fulfilled FROM Request INNER JOIN Item on
Request.item_name=Item.item_name INNER JOIN User on Item.food_bank_id=User.site_id
WHERE User.username=$username;
*/
SELECT Request.username, Request.item_name, Request.request_status,
Request.units_requested, Request.units_fulfilled FROM Request INNER JOIN Item on
Request.item_name=Item.item_name INNER JOIN User on Item.food_bank_id=User.site_id
WHERE User.username="Taylor";

/*View Request Status
SELECT username, item_name, request_status,units_requested,units_fulfilled FROM Request
WHERE username= $username ORDER BY request_status;
*/
SELECT username, item_name, request_status,units_requested,units_fulfilled FROM Request
WHERE username= "Taylor" ORDER BY request_status;

/*Search Clients
SELECT full_name, client_id, description_string, head_of_household FROM Client WHERE
full_name like "%$search_field%";
```

```
*/
SELECT full_name, client_id, description_string, head_of_household FROM Client WHERE
full_name like "%Taylor%";

/*View client data
SELECT full_name, description_string, head_of_household FROM Client WHERE
client_id=$client_id;
*/
SELECT full_name, description_string, head_of_household FROM Client WHERE client_id=1;

/*View Waitlist
SELECT client_id, position from Waitlist WHERE shelter_id=$shelter_number AND
room_number=$room_number ORDER BY position ASC;
*/
SELECT client_id, position from Waitlist WHERE shelter_id=1 AND room_number=1 ORDER
BY position ASC;

/*Delete Waitlist Item
DELETE FROM Waitlist WHERE position=$position and shelter_id=$shelter_id AND
room_number=$room_number;
UPDATE Waitlist SET position=position-1 WHERE position>$position AND
shelter_id=$shelter_id AND room_number=$room_number;
*/
DELETE FROM Waitlist WHERE position=3 and shelter_id=1 AND room_number=1;
UPDATE Waitlist SET position=position-1 WHERE position>3 AND shelter_id=1 AND
room_number=1;

/*Move Waitlist Item
UPDATE Waitlist SET position=position-1 WHERE position>$old_position AND
shelter_id=$shelter_id AND room_number=$room_number ;
UPDATE Waitlist SET position=position+1 WHERE position>$new_position AND
shelter_id=$shelter_id AND room_number=$room_number;
*/
UPDATE Waitlist SET position=position-1 WHERE position>3 AND shelter_id=1 AND
room_number=1 ;
UPDATE Waitlist SET position=position+1 WHERE position>5 AND shelter_id=1 AND
room_number=1;

/*Search Inventory Items
SELECT item_name, number_of_units, storage_type, item_type, food_category,
supply_category,expiration_date, food_bank_id FROM Item where ($expiration_Date="*" or
expiration_date=$expiration_date) AND ($stoarge_type="*" OR storage_type=$storage_type)
AND ($food_type="*" OR item_type=$food_type) AND ($food_category="*" OR
food_category=$food_category") AND($supply_category="*" OR
supply_category=$supply_category) AND item_name LIKE "%$item_name%";
*/
SELECT item_name, number_of_units, storage_type, item_type, food_category,
supply_category,expiration_date, food_bank_id FROM Item where ("*"="*" or
expiration_date='20170618 10:11:12 AM') AND ("*"="*" OR storage_type="dry") AND ("*"="*"
OR item_type="food") AND ("*"="*" OR food_category="Pasta") AND("*"="*" OR
supply_category="N/A") AND item_name LIKE "%Peanut%";

/*Change Inventory Count
UPDATE Item SET number_of_units=$NUM_UNITS WHERE item_name=$ITEM_NAME;
*/
UPDATE Item SET number_of_units=4 WHERE item_name="Peanut Butter";

/*Add Inventory Item*/
/*Get item categories*/
/*Set up food bank to be sure there is one
SELECT distinct(item_type) FROM Item;
SELECT distinct(food_category) FROM Item;

INSERT INTO Item(item_name, number_of_units, storage_type, item_type,
food_category,supply_category, expiration_date, food_bank_id) VALUES ($ITEM_NAME,
$NUM_UNITS, $STORAGE_TYPE, $ITEM_TYPE, $FOOD_CATEGORY,
$SUPPLY_CATEGORY, $EXPIRATION_DATE, $FOOD_BANK_ID);
*/
SELECT distinct(item_type) FROM Item;
SELECT distinct(food_category) FROM Item;
/*INSERT INTO Item(item_name, number_of_units, storage_type, item_type,
food_category,supply_category, expiration_date, food_bank_id) VALUES ("Peanut
Butter",3,"cool","food","Tasty","N/A",'20170618 10:11:12 AM', 1);  Only works one time because
of duplicate key*/
/*View Meals*/
/*Get the total number of meals, and value of whatever we're lowest on
SELECT min(counts.count) as low, max(counts.count) AS total_meals FROM (
SELECT 'vegetable' AS type, count(item_name) AS count FROM Item WHERE food_category =
'vegetables'
UNION
SELECT 'mineral' AS type, count(item_name) AS count FROM Item WHERE food_category =
'beans' OR food_category = 'nuts' OR food_category = 'grains'
UNION
SELECT 'animal' AS type, count(item_name) AS count FROM Item WHERE food_category =
'meat' OR food_category = 'seafood' OR food_category = 'dairy') AS counts;
*/
```

```
SELECT min(counts.count) as low, max(counts.count) AS total_meals FROM (
SELECT 'vegetable' AS type, count(item_name) AS count FROM Item WHERE food_category =
'vegetables'
UNION
SELECT 'mineral' AS type, count(item_name) AS count FROM Item WHERE food_category =
'beans' OR food_category = 'nuts' OR food_category = 'grains'
UNION
SELECT 'animal' AS type, count(item_name) AS count FROM Item WHERE food_category =
'meat' OR food_category = 'seafood' OR food_category = 'dairy') AS counts;

/*Get the category we're lowest on to request more of
SELECT counts.type as send_more FROM (
SELECT 'vegetable' AS type, count(item_name) AS count FROM Item WHERE food_category =
'vegetables'
UNION
SELECT 'mineral' AS type, count(item_name) AS count FROM Item WHERE food_category =
'beans' OR food_category = 'nuts' OR food_category = 'grains'
UNION
SELECT 'animal' AS type, count(item_name) AS count FROM Item WHERE food_category =
'meat' OR food_category = 'seafood' OR food_category = 'dairy') AS counts WHERE
counts.count=low;
*/
SELECT counts.type as send_more FROM (
SELECT 'vegetable' AS type, count(item_name) AS count FROM Item WHERE food_category =
'vegetables'
UNION
SELECT 'mineral' AS type, count(item_name) AS count FROM Item WHERE food_category =
'beans' OR food_category = 'nuts' OR food_category = 'grains'
UNION
SELECT 'animal' AS type, count(item_name) AS count FROM Item WHERE food_category =
'meat' OR food_category = 'seafood' OR food_category = 'dairy') AS counts WHERE
counts.count=2;

/*View bunks/rooms*
SELECT count(Bunk.bunk_number), bunk_type, Shelter.description_string, Shelter.hours,
Shelter.conditions_for_use FROM Bunk INNER JOIN Shelter on
Shelter.shelter_id=Bunk.shelter_id GROUP BY Bunk.bunk_type, Shelter.shelter_id
*/
SELECT count(Bunk.bunk_number), bunk_type, Shelter.description_string, Shelter.hours,
Shelter.conditions_for_use FROM Bunk INNER JOIN Shelter on
Shelter.shelter_id=Bunk.shelter_id GROUP BY Bunk.bunk_type, Shelter.shelter_id;
/*Add Client
```

```
Insert into Client(full_name, description_string, head_of_household)
VALUES($FullName,$Description,$HeadOfHousehold);
*/
Insert into Client(full_name, description_string, head_of_household)
VALUES("Taylor","Smart",True);

/*Check in client to service
SELECT Shelter.shelter_id, Bunk.bunk_number from Shelter INNER JOIN User on
User.site_id=Shelter.shelter_id INNER JOIN Bunk on Bunk.shelter_id=Shelter.shelter_id
WHERE Shelter.available_bunks>0 AND User.username = $username AND
Bunk.bunk_type=$gender OR Bunk.bunk_type="mixed" ORDER BY Bunk.bunk_type LIMIT 1;

UPDATE Shelter INNER JOIN User on User.site_id=Shelter.shelter_id INNER JOIN Bunk on
Bunk.shelter_id=Shelter.shelter_id SET
Shelter.available_rooms=Shelter.available_rooms-1,Bunk.occupied=True WHERE
Shelter.shelter_id=0 AND Bunk.bunk_number=0;
*/
SELECT Shelter.shelter_id, Bunk.bunk_number from Shelter INNER JOIN User on
User.site_id=Shelter.shelter_id INNER JOIN Bunk on Bunk.shelter_id=Shelter.shelter_id
WHERE Shelter.available_bunks>0 AND User.username = "taylor" AND
Bunk.bunk_type="female" OR Bunk.bunk_type="mixed" ORDER BY Bunk.bunk_type LIMIT 1;

UPDATE Shelter INNER JOIN User on User.site_id=Shelter.shelter_id INNER JOIN Bunk on
Bunk.shelter_id=Shelter.shelter_id SET
Shelter.available_rooms=Shelter.available_rooms-1,Bunk.occupied=True WHERE
Shelter.shelter_id=0 AND Bunk.bunk_number=0;

/*Modify bunk count
Update Shelter INNER JOIN User ON User.site_id=Shelter.shelter_id SET
Shelter.available_bunks=$available_bunks WHERE User.username=$username
*/

Update Shelter INNER JOIN User ON User.site_id=Shelter.shelter_id SET
Shelter.available_bunks=3 WHERE User.username="Taylor"
```